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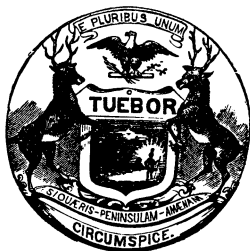
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SPEECH
OF
HON. MARK D. WILBER,
IN THE
SENATE OF MICHIGAN,
MARCH 26, 1873,
ADVOCATING THE CONSTRUCTION
OF THE
MICHIGAN SHIP CANAL.



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1873.

SPEECH

OF

HON. MARK D. WILBER.

In the Senate, March 26, 1873, in committee of the whole on joint resolution No. 2, asking Congress for an appropriation for the survey of the Michigan Ship Canal, Mr. Wilber made the following remarks:

MR. CHAIRMAN :—In discussing the question under consideration, I shall not restrict my remarks to the “Michigan Canal” alone, but treat it simply as one of the links in that great chain of prospective water-ways, that is to wed the outer with our inter-oceans; that is to perfect a navigable channel for ships between the seas of the world and their commerce, and the inter-continental garden regions of the northwest, and their products. No national question of to-day excels in magnitude that of “cheap transportation,” nay, no material question approaches it in public importance; none so immediately affects all, producer and consumer alike; none on which the continuance of public prosperity,—the development of our wondrous resources,—the rapid accumulation of individual and national wealth so largely depends.

Milton says:

“Peace hath her victories,
No less renown’d than war.”

How happily will this be illustrated by Gen. Grant, if the people carry out, as they certainly will, his recommendations.

In the field, the General and his great army were “renowned” with “war’s” proudest “victories;” after these his patriot legions,

—summoned from the “walks of peace,” were “mustered out,” each returning to his normal vocation. Their chief in war, became their chief magistrate in peace ; and looking to the material wants and prosperity of soldiers and civilians, drew upon the map of our country the outlines of a peace campaign,—a campaign in the interest of “cheap transportation,”—for this the old patriot legions are recalled to service, that “peace may have her victories no less renown’d than war.”

The “General Order” is embodied in the President’s last annual message to Congress, in which the question of “cheap transportation” was presented, and a recommendation looking to the perfection of the American canal system, so as to unite the Atlantic with the Mississippi,—as originally designed,—with enlarged water-lines, sufficiently capacious to meet the demands of our immense and daily increasing internal commerce.

The President says: “The attention of Congress will be called at its present session to enterprises for the more certain and cheaper transportation of the constantly increasing surplus of the Western and Southern products to the Atlantic seaboard. The subject is one that will force itself upon the legislative branch of the Government sooner or later, and I suggest that immediate steps be taken to gain all available information to inevitable and just legislation regarding a route to connect the Mississippi valley with the Atlantic.

“That production increases more rapidly than the means of transportation in our country, has been demonstrated by past experience.

“The rapid growth in population and products of the whole country will require additional facilities, cheaper means for the most bulky articles of commerce to reach tide-water, and that a market will be demanded in the near future is equally demonstrable.

“I would therefore suggest either a committee or commission to be authorized to consider this whole question, and to report to Congress at some future day for its better guidance in legislating on the important subject. The railroads of the country have been rapidly extended during the last few years to meet the growing demands of producers, and reflect much credit upon the capitalists and managers engaged in their construction.

“In addition to these a project to facilitate commerce by the building of a ship canal around Niagara Falls, on the United States side, which has been agitated for many years, will no doubt be called to your attention this session.

"Looking to the great future of the country, and the increasing demands of commerce, it might be well, while on this subject, not only to have examined and reported upon the various practicable routes for connecting the Mississippi with the tide-water of the Atlantic, but the feasibility of an almost continuous land-locked navigation from Maine to the Gulf of Mexico.

"Such a route along our coast would be of great value at all times, and of inestimable value in case of a foreign war. Nature has provided the greater part of this route, and the obstacles to be overcome are easily within the skill of engineers."

Such, in part, Mr. Chairman, are the views of the President as expressed in his message.

There are people, however, and there may be Senators here, who believe that the "canal" is an institution of the past; that the demands of an age of steam and electricity cannot longer be met, even in part, by this ancient method of transportation; that the railway has superceded the canal. It is quite true that the express-speed, rattle and confusion, business, cost, charges and accidents, of our great railways, their sometimes arrogant officials, with the nervous, enigmatical, feverish, exciting railway stock-broker, have for some time so absorbed public attention that many have almost forgotten the modestly quiet and conservative "old canal," as she silently bears on her bosom argosies freighted with a greater commerce than her coquetish chariot rival.

First, then, has the railway superceded the canal? If not, how stands the comparison between the two methods as to cost of construction, cost of transportation, and patronage? These are facts precedent and of controlling importance, when examining the question of enlarging or extending our system of inland communication. Conceding the point that our commerce, both East and West, demands new and enlarged avenues, we may be assisted in their prosecution by the tests of others,—for the experiences of nations or companies, are the ablest instructors we can summon to our aid in determining intelligently the practicability, and better methods of executing great public works.

The wise statesman studies these experiences, and where they have resulted in public benefactions and financial successes, so legislates that they may be reproduced for his own people.

Let us look, then, for a moment into

THE HISTORY OF CANALS.

Herodotus and Pliny speak of navigable canals in Asia Minor. The Chinese early appreciated the importance of canals for inland navigation, and as early as the seventh century built a system of canals extending to the remotest parts of their immense territory, until their rivers and canals formed a complete net-work of water communication. The canals of China are unsurpassed in number and length by those of any other country, reaching from five miles in length up to that of the Imperial, which is 1,000 miles long. Drusus, during the reign of Augustus, while extending the conquests of Rome, constructed a canal connecting the Rhine and Yssel.

The great system of canals in the Netherlands were begun in the twelfth century. Her last, and perhaps most important work, was the great ship canal, connecting the North Sea with the river Y. It was built at the same time the Erie was constructed, during the period from 1817 to 1825. The canal is 50 miles in length, 125 feet in width at surface, and 21 feet in depth, through which the largest class of merchantmen and ships of the line are floated. Amsterdam, the Venice of the Netherlands, is built on piles driven through a soft soil 40 to 50 feet to a hard stratum below. Its canals divide it into 95 islands, connected by 290 bridges. To her ship canal the city is almost entirely indebted for her present commercial importance.

Italy is largely supplied with canals, on which her national wealth and ocean commerce largely depend,—for without them the great Italian marble, and other interior trade, could scarcely be maintained.

France has 2,000 miles of canal. In 1681 the French constructed the Languedoc canal, connecting the Atlantic through the river Gironne to the Gulf of Lyons, on the Mediterranean. This canal is 148 miles long. It has 100 locks, and a summit level 600 feet above the sea, as against 250 for the "Michigan Ship Canal."

The waters of Europe,—river, and sea,—are quite generally connected by canals. A vessel can pass from the Mediterranean through France to the Atlantic; or from the Rhone to the Loire

or Seine to the English Channel ; or through Belgium and Holland to the North Sea ; or to the Rhine through Prussia and Bavaria, to the Danube ; or through the North Sea to the Elbe ; or on to the Baltic into the Oder, across to the Spree, up the Elbe to the Danube ; on through Austria, Hungary, and Turkey to the Black Sea ; on through the Suez to the seas of the East, or to the point of departure in the Mediterranean.

Great Britain has 2,172 miles of canal, and 1,315 miles of slack-water or improved river navigation, which cost \$174,000,000. England has been covered with a perfect network of railways, yet the tonnage of her canals has steadily increased. The same on the Continent, wherever the price of transportation is more important to the shipper than time, the railway has been unable to compete with the canal.

Canada, with a population of only 3,485,761, has, by Government aid, canals costing \$14,000,000 ; and among her other public works, beside 4,500 miles of railway, her Victoria bridge cost \$7,500,000, a sum considerably in excess of the original cost of the Erie canal. This shows that Canada is neither unwilling nor unable to avail herself of such opportunities as she has, to divert and control large portions of our internal carrying trade. I shall refer to this again, as a further reason why we should no longer delay these works.

Canal locks were invented by Leonardo da Vinci, five years after the discovery of America.

In 1792, three hundred years after the discovery of America, the South Hadley and Montague canals were built ; the first two, and the last three miles in length. These were the first canals in the United States. Since then about forty others have been constructed, together 4,650 miles in length, costing originally about \$100,000,000, which cost has been doubled by their several improvements and enlargements, a cost in full of about \$200,000,000, a sum less in proportion to their importance and public value, than the cost of any other of our public works. Of these the Erie was the most valuable, because the most needed by the country,—and hence the greatest financial success. From the hour of its completion, the Erie has poured an unceasing stream of

wealth into the lap of New York, State, as well as city; while at the same time the Northwest was equally benefited. The construction of the Erie was suggested by parties long before the Revolution, but the work, as such, was the fruit of the life of DeWitt Clinton. In brilliancy of conception, in successful execution, and as a material blessing to the nation, so long as commerce lasts, the Erie stands without a peer among our internal improvements. No devised method can measure the individual wealth and national progress resultant from such works. So far as the land reaches or commerce extends, wherever capital or labor is invested, and the people produce or consume, they participate in their benefits. The American, who, visiting St. Paul's Cathedral, asks to see the monument of its builder, Sir Christopher Wren, is answered "look around you." If a foreigner traveling in our country should ask to be shown the monument of Clinton, he, too, need but be answered, as you pass from New York city to Chicago, "look around you."

A correct comparison of the two principal methods of transportation involves the necessity of a glance, at least, into the

HISTORY OF RAILROADS.

The first railroad constructed in the United States was the Baltimore and Ohio,—23 miles were opened and operated in 1830.

There are now completed and in operation 1,346 steam railroads.

No. of miles constructed in decade ending 1840	.	.	.	3,513
" " " " 1850	.	.	.	5,508
" " " " 1860	.	.	.	21,614
" " " " 1870	.	.	.	22,764
" " year " 1871	.	.	.	7,453
" " " " 1872	.	.	.	7,925

Total number miles completed in 1872 . . . 68,777

In addition to the above there were under construction and approaching completion over 15,000 miles. The average cost per mile is \$50,000. The grand total expenditure upon the railroads completed, and approaching completion in the United States to

date, exceed THREE THOUSAND EIGHT HUNDRED MILLION DOLLARS; less, however, than the rebellion cost the North in money and less than it cost the South in money, destruction of property, and loss of products. The expenditures on new and old roads for 1872 amounted to \$275,000,000.

Massachusetts has twice the mileage, according to her area, of any State.

The leading railway States stand in their order of mileage as follows :

	Completed Jan. 1, '78. Miles.	Approaching completion. Miles.	Total Miles.
Illinois,	6,741	963	7,704
New York,	5,211	1,935	7,146
Pennsylvania,	5,460	1,113	6,573
Ohio,	4,131	1,117	5,248
Iowa,	3,745	1,241	4,986
Indiana,	3,819	498	4,317
Michigan,	2,535	950	3,485
Massachusetts,	1,678	258	1,936

Such, in brief, are the chief points, showing the progress and present magnitude of our railway system.

On January 1, 1871, before the death of Prof. Morse, there were located along our canals and railways 66,000 miles of telegraph line, the companies transmitting from 5,200 offices 12,000,000 messages annually. Great Britain and Europe had 175,000 miles of telegraph land line. Field had taught the telegraph "Doge" to "wed the seas" with 36,000 miles of cable, so that the land and the deep had 277,000 miles of line, telling the story of the world's commercial progress, in magnetic words that thrilled the nations with their electric eloquence. If you wish to see the monument of Morse, you must make the circuit of the globe and "look around you."

FIRST GENERAL SYSTEM OF INTERNAL IMPROVEMENT.

DeWitt Clinton did not close his public improvement career when the Erie canal was constructed, nor at the completion of its laterals, which with the Erie constituted the New York system,

but recommended and aided the canal projects of the other States, which were prosecuted until the principal rivers, lakes, and sounds of the United States were completely connected.

So extended was this original system, that nearly or quite a generation since, a vessel could pass from Mobile to New Orleans, up the Mississippi by St. Louis to and through Wisconsin, into Lake Michigan, or through Illinois to Chicago; touch at Milwaukee, around the lakes to Detroit and Buffalo; or up the Ohio to Louisville, and through Indiana to Toledo; or to Cincinnati and through Ohio to Cleveland; or to Pittsburg and through Pennsylvania to Erie, and on to Buffalo; then enter the Erie canal on to Albany and New York; or through the Welland into Ontario, to Oswego, to Syracuse, across to Pennsylvania and enter the Susquehanna; or down the St. Lawrence to Montreal, through Lake Champlain, on to the Hudson, and by the Delaware and Hudson canal through southeast New York, to the Delaware river and Pennsylvania; or down the Hudson to New York city, and through New Jersey, passing Newark, Trenton, and Princeton, to Philadelphia; through Delaware to Baltimore; down the Chesapeake by Annapolis to the Potomac, up to Washington; or by Norfolk and the James to Richmond and the Virginia canals; or through the Dismal Swamp, Albemarle, and Pamlico sounds, to Newbern and Beaufort,—river and canal enough to reach half-way around the globe.

If the infancy of our country and its commerce demanded such works, what must be their present needs? The Erie canal and the St. Lawrence and Champlain are the two navigable channels on which the great West is compelled to depend for cheap transportation. These have five great competing railway lines, the Grand Trunk, New York Central, Erie, Pennsylvania Central, and Baltimore and Ohio; yet the five railways combined carry a lesser tonnage in twelve months than the two canals in seven and one-half months of the year. The amount of eastward-bound tonnage over the three principal trunk lines of railway, in 1862, is shown in the following

STATEMENT FROM OFFICIAL REPORTS.

	Tons Eastward.
New York Central Railroad,	616,177
New York & Erie "	471,314
Pennsylvania Central "	502,884
	<hr/>
	1,590,375
Erie and Champlain canals,	3,402,709

This proves that the railroad has not superseded the canal.

The cost of transit by rail, as compared with canal, is as three to one ; and the cost by canal would still be materially lessened by the enlarged and extended system proposed, which shows the economy of canal transportation.

NECESSITY OF ENLARGED AND ADDED COMMERCIAL AVENUES.

In determining the practicability and need of extensive avenues of internal communication, many facts have to be taken into consideration. The practicability of a canal depends upon the topography of its proposed line, and water supply ; its need, upon the insufficiency of existing channels ; its magnitude, upon the area, population, resources, products, and prospective growth of the territory requiring it.

The practicability of a ship canal from the Hudson to the Mississippi has been established by the existing lines and their known water supply,—except as to the section through Michigan, and of this I will speak hereafter. All commercial men know and concede that the existing avenues of communication between the upper Mississippi valley and the seaboard are entirely insufficient to accommodate the imperial traffic of the country, which is yet in its infancy.

TERRITORIAL AREA.

The United States includes in its limits, land surface 3,603,884 square miles ; adding water surface, great lakes and rivers, makes total area 4,000,000 square miles. The empires, kingdoms, and republics of Europe, including 2,041,809 square miles Russian territory, has 3,681,057 square miles. Immense areas, like all great sums expressed by millions, are beyond the powers of the

mind to grasp, and can only be comprehended by comparisons. Thus, California is equal in extent to Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, and Pennsylvania. Texas is nearly equal to California, New York, and Pennsylvania. Again, California is equal in area to England, Ireland, Scotland, Wales, Belgium, Holland, and Portugal. And Texas equals Holland, Belgium, Denmark, and the Republic of France. Texas and California united equal the present territorial limits of the thirteen original Federal States.

The system of canals under consideration communicates directly with the Atlantic board, and the valleys of the St. Lawrence and Mississippi.

THE ST. LAWRENCE

drains an estimated area of 600,000 square miles. Of this, the territory drained into the great lakes is estimated at 335,515 square miles.

THE GREAT LAKES

have a united extent of 90,300 square miles, with nearly 5,000 miles of shore line, while that on the Atlantic is but 3,500.

MISSISSIPPI RIVER AND VALLEY.

The Mississippi-Missouri river is 5,500 miles long,—nearly sufficient to reach from the mouth of the Hudson to the mouth of the Nile. It is navigable for 3,900 miles, a distance greater than from Washington to Rome.

The Mississippi has 1,500 navigable branches, aggregating a navigable length sufficient to encircle the globe. This river drains an area of over 1,500,000 square miles, reaching from the Alleghanies to the Rocky Mountain range; from the tropic Gulf to the high latitudes of the British possessions.

The Amazon drains 2,330,000 square miles of South America, but the Mississippi, perhaps, drains the largest and most fertile cultivated valley in the world. A garden-realm, over which the Goddess Ceres reigns, with an inverted cornucopia. The product of this region is rapidly approaching such fabulous dimensions that the magnitude of its future yield is beyond present means of computation.

THE UPPER MISSISSIPPI VALLEY

is composed of three subordinate basins, whose respective divisions are as follows :

	Square Miles.
Ohio basin,	214,000
Upper Mississippi basin,	169,000
Missouri basin,	518,000
<hr/>	
Total area,	901,000

The States located in this valley are known as the "food producing States," and to them cheap transportation is becoming almost a vital necessity.

POPULATIONS.

The inhabitants of the United States now number 40,000,000,—those of Europe 270,000,000. The territory of the United States is about seventy times greater than that of England, and if capable of supporting a population one-fourth as dense, it has room for 350,000,000 of people,—or 310,000,000 more than at present.

At the time of the passage of the first act for the survey of the proposed Erie canal, 1791, the population of the United States was 3,929,214,—453,545 less than the population of the State of New York in 1870. Not one of the Northwestern States was named in the census of 1790, and the population of the territory west of the Falls numbered less thousands than it now numbers millions.

The States most interested, because most dependent upon increased and cheaper transportation facilities between the East and the West, are what I shall term the food producing, and the consuming and exporting States,—ten of each.

The consuming and exporting States are the New England States, New York, New Jersey, Delaware, and Pennsylvania. The food producing States, Ohio, Indiana, Illinois, Wisconsin, and Michigan, east of the Mississippi, and Missouri, Kansas, Nebraska, Iowa, and Minnesota, west of the Mississippi.

In 1820, when the Erie canal was approaching completion,

these ten Eastern consuming States numbered 4,419,372 inhabitants, and the territory of the ten producing States numbered 858,947. Such were the populations for which the Erie canal was built.

By the census of 1870, the ten consuming States had increased their population to 12,423,661, and the ten producing States to 12,969,230.

The following tabulated statement presents, at a glance, the relative growth and populations of these States :

	1820.	1870.
Maine,	298,269	626,915
New Hampshire,	244,022	318,300
Vermont,	235,966	330,551
Massachusetts,	523,159	1,457,351
Rhode Island,	83,015	217,353
Connecticut,	275,148	537,454
New York,	1,372,111	4,382,759
New Jersey,	277,426	906,096
Delaware,	72,749	125,015
Pennsylvania,	1,047,507	3,521,951
	<hr/>	<hr/>
	4,429,372	12,423,745
	1820.	1870.
Ohio,	581,295	2,665,260
Indiana,	147,178	1,680,637
Illinois,	55,162	2,539,891
Wisconsin, . . . . .	.....	1,054,670
Michigan,	8,765	1,184,059
Missouri,	66,557	1,721,295
Kansas, . . . . .	.....	364,399
Nebraska, . . . . .	.....	122,993
Iowa, . . . . .	.....	1,194,020
Minnesota, . . . . .	.....	439,706
	<hr/>	<hr/>
	858,957	12,966,930
Population of the United States in 1790,		3,929,214
At completion of Erie Canal, 1825, about		11,000,000

Population in 1870, 38,558,371
 The past ratio of increase would make the present
 population of the ten Eastern consuming States,
 about 13,000,000
 And of the ten producing States, about 15,000,000
 And the total of the United States for 1900, about 100,000,000

What then must be the magnitude of our commercial avenues for the populations of this near future, if the existing channels are insufficient for the present?

RESOURCES AND PRODUCTS.

I very much regret that the estimates to be given under these headings can be but approximate, and in some instances governed only by individual speculation. Had the Census Bureau issued early, a compendium of the products of agriculture, manufacturing, and mining, it would have been of quite as much benefit to the people, as the full census tables will be when published. They are already old when given to the public. What we want are the facts now!

AGRICULTURAL.

The wheat product of the consuming States, calculated upon their decreasing ratio, as shown by the seventh and eighth censuses, is about as follows: New England raises barely sufficient to feed her population two weeks; New York, four months; New Jersey and Delaware, six months; and Pennsylvania, eight months, while Ohio yields, perhaps, a surplus of 2,000,000 bushels.

The cereal product of the United States for 1850, in wheat, rye, oats, buckwheat, barley, corn, peas, and beans, was 876,673,868 bushels; and for 1860, 1,254,101,940 bushels.

The increasing ratio of cereal products has been above 40 per cent for each census decade. Upon this basis the product for the present year will be largely in excess of 1,900,000,000 bushels.

CHICAGO.

The report of the Illinois Central Railway Company for 1872 shows the net earnings of their roads to have been \$629,740 less than for the preceding year. As a reason for this the company says:

"The disastrous fire at Chicago in October, 1871, had left us but one grain warehouse, which was filled early in January, restricting grain shipments to Chicago until the opening of navigation in April. Again, before June 1st, we were forced to decline receiving grain for shipment to Chicago faster than it could be disposed of there. A large increase in the price of iron stimulated its production last year in this country enormously, and created an unusual demand for the iron ores of Lake Superior for the furnaces of Ohio and Pennsylvania. This diverted a large number of vessels from the grain trade, causing a two-fold effect upon our traffic."

This shows part of the diversion of shipments from Chicago on the South. The same reasons gave Racine and Milwaukee much greater receipts on the North. In addition to this, attempts were made in Chicago during the year, through a "corner," to control the prices of grain, which operated to a certain extent disastrously to the trade of the city. Yet, notwithstanding all their misfortunes, the report of the Chicago Board of Trade for 1872 shows their receipts in grain of all kinds—reducing flour to bushels—to have reached nearly 90,000,000 bushels. From this it would appear that the normal receipts of Chicago alone would be considerably in excess of 100,000,000 bushels, equaling 3,000,000 tons. This is as great as the whole eastern tonnage of the Erie Canal for a year, and would require the five great railway lines,—the Grand Trunk, N. Y. Central, Erie, Pennsylvania Central, and Baltimore & Ohio, at ten trains each per day, twenty cars per train, ten tons per car, 300 days in the year, to transport the grain of this single city of the west to tide-water.

The receipts of cattle at the Chicago yards for 1872 were 648,075; swine, 2,652,549. The value of these, together with the sheep and horses received, was \$75,475,000.

LUMBER.

The receipts of the year were 1,183,659,283 feet and 610,824,420 shingles.

Receipts of coal were upwards of 200,000 tons.

The wholesale trade of the city reached nearly \$500,000,000.

The manufacturing interests of Chicago are large, but I have no exhibit of their last year's product.

RECEIPTS OF FLOUR AND GRAIN FOR TWENTY-ONE YEARS.
The following Table shows the aggregate Annual Receipts of Flour and all kinds of Grain in Chicago; also, the amount of Flour manufactured in the city for each year since 1851.

YEAR.	Flour Manufactured in the city, Barrels.	Flour Received, Barrels.	Wheat Received, Bushels.	Corn Received, Bushels.	Oats Received, Bushels.	Rye Received, Bushels.	Barley Received, Bushels.	Total Rec'pts Flour reduced to Wheat, Bushels.
1852.....	70,979	53,337	937,496	2,391,011	2,039,941	21,015	127,028	6,406,508
1853.....	82,833	43,297	1,657,465	2,869,339	1,875,770	86,162	192,357	6,928,439
1854.....	66,000	153,575	3,088,935	7,490,733	4,194,835	83,691	201,764	15,725,135
1855.....	79,650	240,662	7,535,097	8,532,377	2,947,183	63,166	201,805	20,367,702
1856.....	86,068	324,921	8,767,760	11,888,398	2,219,937	43,707	128,407	24,512,454
1857.....	96,000	393,984	10,554,761	7,409,000	1,707,345	87,711	127,659	21,659,109
1858.....	140,403	522,137	9,639,614	8,232,641	2,833,597	71,012	413,812	23,610,293
1859.....	161,500	726,321	8,060,766	5,401,870	1,737,696	231,514	652,696	19,372,966
1860.....	232,000	713,343	14,927,033	15,662,394	2,193,859	313,976	617,619	37,235,927
1861.....	291,352	1,479,284	17,335,002	20,369,939	2,067,018	490,989	457,359	53,497,365
1862.....	260,930	1,666,391	13,973,116	29,374,313	4,638,732	1,033,325	872,033	57,650,594
1863.....	236,261	1,424,206	11,408,161	26,611,633	11,036,131	865,508	1,230,342	57,666,722
1864.....	253,056	1,205,693	12,154,977	13,307,745	16,331,616	1,060,116	1,018,313	49,543,903
1865.....	233,320	1,134,100	9,206,410	25,932,201	11,630,630	1,140,264	1,774,139	54,360,114
1866.....	445,232	1,347,145	11,973,733	33,543,061	11,140,264	1,679,541	1,742,632	63,396,423
1867.....	574,096	1,730,001	13,695,244	22,772,715	12,335,006	1,291,321	2,360,954	69,213,774
1868.....	732,479	2,192,413	14,772,094	23,570,494	16,032,910	1,323,820	1,915,056	69,680,293
1869.....	543,235	2,213,822	16,376,760	23,475,800	10,611,940	935,301	1,513,110	63,417,510
1870.....	443,967	1,766,037	17,394,409	20,159,775	10,472,073	1,093,493	2,335,633	60,432,374
1871.....	397,739	1,412,177	14,439,656	41,333,193	14,769,414	2,011,738	4,069,410	83,513,202
1872.....	156,968	1,532,014	12,734,141	47,366,037	15,061,715	1,123,036	5,251,750	88,426,542

DIRECT FOREIGN TRADE.

The shipments for 1872 to foreign countries by rail, on bills of lading, was over 77,000 tons.

Population by U. S. census, 1870,	298,977
“ city census, June, 1871,	334,270
“ “ “ October, 1872,	367,396
“ estimated for Jan. 1, 1873,	380,000

Assessed valuation of property, \$284,197,430.

Such in part is the commercial record Chicago is making. Add to this all the cities of the West, and to them the cities of the East, and through what channel is the commerce they are building up to find transit?

HAY.

This crop has now reached an annual product of 27,000,000 tons.

COTTON.

In 1860 there were 5,387,000 bales produced, with but one acre in fifty of the cotton lands of the South under cultivation.

TOBACCO.

Product of 1860, 434,209,461 pounds.

WEALTH OF FARMERS.

The assessed value of farms and stock in 1860 was about \$8,000,000,000 in gold; it is now over \$10,000,000,000, and the assessed value is not one-half its actual value.

MINING.

There is no end to our mineral wealth. Professor Rogers, Professor of Geology in the University of Glasgow, many years since estimated the extent of our then discovered coal fields at 325,000 square miles,—an area equal to Great Britain, Ireland, and France,—and capable of supporting a population of 1,000,000,000, 60,000 years. Since then about one-half as much more has been discovered in our great territoried West. Great Britain and Ireland have but 9,000 square miles. The mines already developed produced in 1860 15,173,750 tons; an increase over 1850 of 169.9 per cent. An increase of 100 per cent from 1860 to 1873 would make the present product over 30,000,000 tons annually.

IRON,

The great element of the age, that chains steam and holds it as a dynamic agent for man's use, and subject to his bidding ; the lever with which the nineteenth century is raising manufactures, commerce, and the arts to the highest plane known to civilization ; the agent that carries the electric current from nation to nation, asking, "What hath God wrought?" has been deposited all over our land, in quantities unknown and undreamed. These mines are filled with the purest hematite, magnetic, red oxide, and specular ores in the world. They are the veriest treasure-houses of nature, in which are locked riches beyond the wealth of numbers to compute ; we have as yet but opened their outer doors,—their great inner chambers are unexplored. The manufacture of American iron is in its infancy, yet the mines produced ores enough in 1860 for 987,559 tons, and in 1872 for 3,000,000 tons of iron, and the product for the present year will be increased at least half a million more, nearly equaling the product of Great Britain in 1861, which was for that year 3,712,390 tons. In 1640 the total iron product of Europe did not exceed 100,000 tons, of which 60,000 tons were made in Sweden and Russia. The product of England was about 17,350 tons. In 1788 Watt's great invention of the steam engine was introduced, which produced so great an increase in the business that in 1796 the production of Great Britain reached 125,079 tons. In 1806 Great Britain had advanced to 258,206 tons, but the annual make of the world did not at that time exceed 500,000 tons,—less than one-sixth of the present annual production of the United States.

In 1784, Henry Cort, an Englishman, invented the process of puddling, converting cast iron into wrought, by reverberatory furnaces, and forming these rough masses into bars by grooved rollers. "This inaugurated a new iron era. Without these inventions the present iron business could not exist ; railroads would be impracticable ; and iron ships could not be built. The wealth of the universe would not be adequate to the production of iron on a scale now rendered essential by the wants of civilized life."

In 1825, at the completion of the Erie canal, Great Britain produced 581,367 tons.

The hot blast was introduced in 1829, and the use of anthracite coal in 1837. So marked was the effect of these discoveries that in 1836 the British make was 1,000,000 tons; and in 1854, 3,585,906. At that date the product of the world was 6,889,906 tons, of which the United States produced 1,000,000,—grown from 20,000 tons in 1820. Last year our railroads used 1,500,000 tons of rail, 900,000 tons of which were imported. Yet 15 years ago, A. S. Hewitt, Esq., before the American Geographical and Statistical Society, said that “the United States have greater natural resources for the production of iron than any other country of the earth, in consequence of the moral elements which characterize the nation, the unlimited possession of mineral coal, the abundance and richness of its ores, and the vast system of natural and artificial avenues of transportation which traverse the land. The United States possess three-fourths of the coal area of the globe. That coal exists in nearly every State of the Union, and where it does not exist it is readily accessible to the main deposits of iron ore in the non-bearing coal States. At the most important localities for the purpose of making iron, immense bodies of coal exist above water level; whereas, in England it has to be mined and raised from the depths of the earth. Measuring by the coal area, and iron ore being equally abundant—it is the true standard—the United States can produce 50,000,000 of tons per annum with as little drain on its natural resources as Great Britain can produce 3,500,000. And in this connection it is essential that a most important fact be noted. To produce 3,500,000 of tons in Great Britain requires the consumption of 45,000,000 tons of raw material, or about 13 tons to each ton of iron. In the United States, from the greater richness of the ores, and the more general use of anthracite coal, the same results could have been achieved with less than half the quantity of raw materials. In fact, the materials for making a ton of iron can be laid down in the United States at the furnace, with less expenditure of human labor than in any part of the known world.

“A century hence, when the world will require its 100,000,000 tons of iron, more than one-half of it will be produced in our great West. The traveler who passes down its great rivers at night

will be lighted on his way by the answering fires of 10,000 furnaces, so that the 'ineffectual moon shall pale' before the mighty glow of human industry." I shall add no further word to this exhibit of the importance, growth, and future transportation need, of this single commercial product.

GOLD.

The whole western half of our continent is a gold field; "the eternal hills" and flowery valleys are filled with gold. The mountain ranges, from their ice-clad heights to depths unknown, are but quartz giants, holding the golden treasure locked in their stony hearts, waiting the miner's coming. The U. S. Commissioner of the General Land Office estimates our gold-bearing territory at nearly 1,100 miles square, or 1,210,000 square miles, and the annual yield at \$100,000,000. Before the discovery of the California mines, the annual gold product of the world was estimated at only \$18,000,000.

COPPER.

The product for 1872 of the Michigan mines was 15,174 tons.

PETROLEUM.

The coal oil product in 1860 was 1,092,450 barrels.

SALT.

This, one of life's essentials, is produced in several States. Amount for 1860, 12,717,200 bushels.

PAPER.

Manufactured in 1860, 253,778,240 pounds; probably 400,000,000 pounds in 1870.

WORK.

This is the greatest American resource. The native wealth of any country, however great, is valueless without it. But the present generation, by the general introduction of steam, has revolutionized the methods and products of man's labor. A century ago the mechanic forged out by hand what now is fashioned by the steam hammer, the roll, and lathe, under the supervision of the operative, while he, the sceptered prince of to-day, sits half his hours reading the morning newspaper, the encyclopedia of the workingman.

Nature has done her part for us, and by skilled industry we must do ours. Nature, like God, helps those who help themselves. Iron wrought into steel, and steel into watch hair-springs, is worth \$5,000 per ounce,—200 times the value of gold.

The population of Massachusetts is 1,457,351. What they accomplish by the aid of machinery is equal to the hand product of 100,000,000 of men.

MANUFACTURES.

The number of manufactories in the United States in June, 1870, was	252,148
Operatives,	2,053,911
Capital invested,	\$2,118,000,000
Annual salaries paid,	\$776,000,000
Raw material,	\$2,488,000,000

And the product was measured in value by the fabulous sum of \$4,232,000,000, grown from \$1,885,861,676 in 1850.

MICHIGAN.

This State has within its own territory native resources almost sufficient to support a nineteenth century civilization. In cereal and pastoral productiveness she ranks with the first. In fruit she has no superior; while in mining, manufacturing, and commercial advantages combined, she has no equal. I am unable to give her grain and cattle product for the last few years. The wool clip for 1868 was 14,500,000 pounds. Her fisheries for the same year produced 93,000 barrels. The value of the fruit crop in the lake shore region for 1871 was \$1,150,000. The geological survey shows a salt area exceeding 17,000 square miles. The report of the State Salt Inspector shows the product for 1872 to have been about 1,158,000 barrels.

A large portion of the Lower Peninsula has coal, but its limits are yet undefined. The development of these fields has just begun. Coal mining, however, will soon become one of the leading industries of the State.

The central and western counties and the shore of Lake Huron contain immense deposits of gypsum. The product of these beds in 1870 was 48,000 tons.

Lumber is one of the leading interests. The amount manufactured in 1870 was 2,400,000,000 feet.

Limestone, sandstone for building, and grindstones, fine sands, aolin, brick and fire clays, are found in various portions of the Lower Peninsula, together with saline, sulphur, and magnetic mineral waters, in great abundance.

THE UPPER PENINSULA

Is destined to excel any country in the world in its iron product. The mineral range extends for hundreds of miles. In many places the hills and mountains seem to be composed of iron ore. They are not mined, when now worked, but literally quarried, above drainage. The depth of these deposits is unknown; they are simply inexhaustible. With a ship canal to New York, so that a vessel could load at Marquette or Escanaba for the Clyde or Mersey, England could be supplied at less expense from Michigan than the cost of producing ores from her deep mines. This, however, is one of the certainties of the future.

The total product of the Upper Peninsula of ore and pig iron in tons, with the aggregate value of the same, was as follows during the years named :

	Ore.	Pig Iron.	Value.
1872	896,877	38,072	.....
1871	813,349	51,225	\$6,013,445
1870	856,741	47,848	5,339,804
1869	643,238	38,504	4,973,435
1868	493,290	36,425	3,676,700
1867	460,320	30,911	3,475,720
1866	296,872	18,437	2,405,960

The iron-masters expect the product for the present year will exceed 1,600,000 tons, an increase of 70 per cent in one year.

The product of the Superior copper mines for 1872 was 15,174 tons.

Silver ore has recently been discovered in quantities that were deemed incredible; and from assays made, it is pronounced unusually rich.

Tin has also been discovered, and there will be added values to

Michigan's immense mineral wealth. Some of the finest red sandstone quarries on the continent are now being worked near Marquette. Limestone for flux in reducing ores is very abundant. Beds of fire-clay and asbestos have been found, and many minerals of less general use.

The manufacturing interests of this State are rapidly increasing. The Detroit Board of Trade report for 1872 says :

“The manufacturing business of Detroit will reach an aggregate of full *forty millions a year*. Not only this, but manufacturing was never more prosperous than at present, and almost daily new enterprises are launched, or old ones revived and extended, so that Detroit bids fair to become at an early day one of the leading manufacturing points in the West.”

Our own copper is being largely manufactured at home.

Lake Superior iron, it is being discovered, is better for car-wheels than the English, and equally well adapted to the manufacture of steel.

Tin is worth more than gold as an article of practical utility.

With all these as native products, and unlimited quantities of coal at our own doors, with 5,000 inland lakes for any purposes required, what may not be the manufacturing future of Michigan?

Her commerce is necessarily great, and doubled by her double peninsular conformation. The word peninsula is historic. The peninsula of Greece was the home of science and the world's culture for eighteen hundred years. The peninsula of Italy made Rome mistress of the nations half as many centuries. Spain, lying on two seas, controlled them for other centuries. It is the commerce of such geographical formations—their natural and consequent intercourse with the world—that makes them great.

Now, Mr. Chairman, do we need additional transit facilities for all this product, all this trade, all this commerce, and the wants of the future great West?

The Chicago Board of Trade report says :

“The means and cost of transportation have probably engrossed a larger share of public attention during several years past than any other question of public concern, and the proper remedies for the evils under which this country is laboring do not seem to have as yet been devised. Certainly it is a subject worthy of the most

earnest consideration, for upon its issues depends the prosperity of the whole country, especially that portion of it largely devoted to agricultural pursuits. When, as now, it costs the farmer in many cases from one-half to three-quarters of the value of his crop to transport it to market, the question of that cost presents itself to his mind, justly, as one of vital importance. Waiving any discussion in this place in regard to the efforts that have been made looking to some degree of control over the railway charges in this and other States, and of the results thus far attained in that direction, the subject of transportation eastward may properly be alluded to. That the rates current for the past year or two must, if possible, and by some means, be reduced, is apparent to all. Enlarged facilities and increased competition by rail will, it is hoped, at an early day, at least partially relieve the West from its embarrassment, and various projects are suggested looking to this end. No entirely new lines from Chicago to the seaboard have been opened for about fifteen years, during which time the Northwest has more than doubled in population and production; true, facilities have been greatly increased, and new competition over parts of the route has been established, but wholly independent lines are now no more numerous than then, nor is there any immediate prospect of relief in this direction.

“That the National Government is in duty bound to adopt some measure for the relief of the most important interest in the country seems to be largely conceded, and projects looking to this end are numerous, the friends of each pressing it with a vigor worthy of the importance of the subject. It must be conceded that the most effectual competition is that furnished by an unrestricted and free water route. No better illustration of this can be afforded than the fact that the business of grain carrying from Chicago to Buffalo by lake is profitable at six cents per bushel, while railroad companies claim it is not remunerative from Chicago eastward an equal number of miles, at less than from three to five times that sum. Assuming that there is at least a large difference in the two modes of transportation in favor of that by water, it would then seem that the first duty of the government would be to exert its influence to open up all possible facilities in that direction.”

The report of the Detroit Board of Trade says :

“The fact is forced upon the attention of all interested in the welfare of the great grain-producing centers, that something must be done immediately to reduce the cost of moving our leading cereals to the seaboard, and to the great centers of consumption in Europe. Corn at 65 cents and oats at 43@48 cents at the seaboard will not pay the cost of marketing in many parts of Southern Illinois, Iowa, and contiguous States, saying nothing of the cost of production. The great question of cheap transportation demands attention and solution, and cannot longer be deferred.

"Political power is now becoming centered in these sections, and no State or interest elsewhere can much longer build a wall to hinder or lay a barrier to the free and cheap transportation of leading staples from the centers of production to the markets of the world.

"This necessity that is pressing has stimulated greatly the construction of railroads, and probably during no previous year have so many miles of new roads been built or such improvements in old lines been made as during 1872; while the necessity of increased facilities and capacities in our water communications with tide-water has also been more fully and generally realized; and at last some steps have been taken to secure the same."

PROPOSED NEW CANALS.

THE ATLANTIC AND GREAT WESTERN.

The route, as proposed, is from the mouth of Short Creek on the Tennessee River, two and one-half miles below Gunter'sville, Marshall county, Ala., which is the most southerly point reached by the Tennessee, up Short Creek by canal and slack-water navigation, crossing at the base of Sand Mountain to Wills's Creek, and down that valley to the Coosa River, two miles and a half below Gadsden, at the junction of Cherokee and Calhoun counties; thence up the Coosa to the Etowah, at Rome, Ga., up the Etowah and Little Rivers to Merritt's Creek, and up this stream until the line of the summit level is reached, 1,008 feet above the sea. Here the level stretches generally east and south by a tortuous route, crossing the Chattahoochie by an aqueduct and embankment 1,900 feet in length, after passing through the ridge dividing the Etowah from the Chattahoochie by a tunnel of 3,200 feet, following numerous small streams and cutting through Peach Tree Ridge, it reaches a small creek, which is stated by the engineers to be "significantly called" Ague Creek, down Ague Creek to Yellow River, and thence by the Ocmulgee and Altama to Altamaha Sound, at Darien, Ga.

The cost of this work is estimated at \$43,892,520. This project is of great importance, doubtless, to the Southern States; but as an outlet for Western grain it is subject to two grave objections. The summit level being 1,008 feet above the sea, assuming that the lockage on the west slope of the mountains is but one-half that

on the east, this would give an aggregate lock-lift of 1,512 feet. Again, except for winter shipment, the latitude of Savannah would be objectionable.

But for this, the Valley of the Mississippi would require no other outlet than its own river. Shippers find, however, that in shipping from the grain valleys to Europe via New Orleans, the voyage is so long, and the distance so great through the hot Gulf and Gulf Stream, that grain often heats and not unfrequently whole cargoes spoil. This is why New Orleans cannot compete with New York, or the Mississippi with the Northern lines. The same grievous objection obtains in the shipment of Russian grain from the Black Sea ports to England. The climate of the south of Europe and the Mediterranean is so hot that, in discharging cargoes in England, they are often found so heated and baked as to require the use of a pick to remove them.

JAMES RIVER AND KANAWHA.

The location of the line decided upon ascends Fork Run from its mouth by a canal of the dimensions before mentioned as adopted, with six locks of twelve feet lift each, to the summit level, which is 1,700 above tide. It then passes under Tuckahoe and Kate's mountains by a tunnel 7 8-10 miles long and 52 feet wide by 34½ feet in height from its bed, and having 7 feet of water, the bed of the canal being 46 feet wide at water line, and thus allowing a width of 6 feet for towing purposes; this emerges into Tuckahoe and Howard's creeks and descends to the Greenbrier by three locks, having ten feet fall each. From this point, except at two points in passing falls, the line consists of slack-water navigation to the mouth of the New River at Lyken's Shoals, and thence to the Ohio by throwing dams across, having sluices for the passage of vessels. This part of the work will require 55 dams, exclusive of those in the Kanawha, having from 12 to 41 feet fall, and provided with suitable locks.

The cost of the improvements of this line, in addition to the present James River Canal, is given at \$48,000,000. If the improvements were made for this sum, I do not think it could compete with the line from New York to Chicago.

It is claimed that the Northern canals are closed with ice for four or five months of the year, and that the James River Canal could be kept open the whole year. Our canals are open during the season when most needed. Then, too, canals require many weeks each year for repairs, which cannot be conducted when filled with water; and this work is largely done on the Northern canals during the winter months.

Again, supposing the James River and Kanawha Canal was completed and in operation, with boats drawing seven feet as contemplated, how are such vessels to run from the mouth of the Kanawha down the Ohio to the Mississippi, from June to October? It will be observed, also, that the summit level of this canal is a tunnel 7-8-10 miles long, and 1,700 feet above tide-water. This tunnel would be longer than that under Mount Cenis, and nearly twice the length of the Hoosac, which latter was begun nearly a generation ago, and is not yet completed.

In reviewing the proposed competing lines, we must examine those of Canada, for our Canadian friends are not ignorant of the great want of the West, nor of the immense wealth to be derived from its carrying trade. They say, "The great God, when he made the mighty West, made also the lakes and the mighty St. Lawrence to float their commerce to the ocean." They propose to construct a canal from Georgian Bay to the Ottawa or to the St. Lawrence. Their estimate for this is \$40,000,000. The Canadians claim that by this route "the dangerous and vexatious navigation of the St. Clair flats and of the rivers would be avoided." They might add, and truly, that this desired result would be much more easily and cheaply accomplished by constructing the "Michigan Ship Canal." We should not, however, delay this work until the Georgian Canal is built, and even a part of our commerce diverted through that channel.

The exact converse of the objections that obtain in the Mississippi and Gulf route are found to exist against the St. Lawrence route. The mouth of the river is too far North. Nine months of the year are endangered by fogs and three months with the ice,—the islands. The storms of the Gulf of St. Lawrence make its

navigation extremely hazardous, the extra insurance alone by that route being sufficient to pay the Erie Canal tolls.

We have left, then, the original Erie, Niagara, and Michigan route. This channel, properly extended and enlarged, can transport the products of the West to the seaboard at less expensive rates than any other possible line.

THE ERIE CANAL.

It is not generally known that the level or prism capacity of this canal is six times greater than its lock capacity. The prism has a capacity for boats of 600 tons. The present locks admit boats of only 200 tons. Enlarging the locks to 600 tons capacity, and doubling them, would add six times to their capacity. Increasing the number of boats does not increase the tonnage of the Erie. The locks can pass but so many in a given time, hence the limit to its commerce is now reached.

Improvements are being made in lockage by introducing the tumble-gate, and by utilizing the power lost in the passage of the feed water between the locks, by applying it to machinery for opening and closing the gates without the aid of manual labor, and also to aid the boat in entering and leaving the lock. By these appliances the 600-tons boat can be locked as quickly as the 200-tons boat by the old method.

The Erie has the best lockage for its length of any canal in the world. It has no high level, no locking up and down again, only from the Lake Erie level down to tide-water.

The estimated cost of enlarging the Erie locks to 200 feet length and 25 feet width, with such occasional widening as the prism might require at narrow points, is \$13,500,000.

NIAGARA SHIP CANAL.

The United States survey for this work gives length, 7 miles and 4,040 feet; width of canal, 100 feet; depth, 10 feet; locks, 200 feet long and 50 feet wide. Cost, \$3,610,596.

THE FOX AND WISCONSIN RIVER IMPROVEMENT.

This route has been partially improved by a private corporation, uniting the Fox and Wisconsin Rivers by a channel with four feet

of water. The cost of enlarging the locks, so as to admit a boat 200 feet long and 34 feet beam, and deepening the channel to six feet at the lowest stages, and the improving of the lower Wisconsin to a permanent depth of at least six feet, Mr. Jenne, the former superintendent, estimates at \$1,250,000. A trifling cost to admit vessels of this size to pass from Lake Michigan to the Mississippi.

IMPROVEMENT OF THE ILLINOIS AND MICHIGAN CANAL, AND THE ILLINOIS RIVER.

The enlargement of this line to a width of 160 feet, with locks 350 long and 75 feet wide, which would admit the largest Mississippi steamers, uniting St. Louis and Chicago, or the lower Mississippi and the Lakes, is estimated to cost for both canal and river, \$13,446,625.

This brings our investigation down to our own section, the last remaining link in the chain.

THE MICHIGAN SHIP CANAL.

On the 13th of February, 1838, "The Commissioners of Internal Improvement" for the State of Michigan made a "report to the Legislature on the practicability of constructing a canal from Mount Clemens to Lake Michigan, in the county of Allegan." The report says that "a canal can be constructed throughout the entire distance, and at as reasonable an expenditure, taking the whole line together, as works of a similar nature in any other section of the Union." The report also embodies the report of the engineer, which shows that "several long levels may be obtained, and an abundant supply of water procured, at all seasons, at a moderate expense." The Commissioners further report: "As to the doubt that a sufficiency of water could be obtained for the summit level, that question is now settled, and it remains for the Legislature to say how soon a work so splendid shall be commenced and pushed to completion."

When the State sold out its railroads, it also disposed of its interest in this canal, and although about \$100,000 had been expended, the project was abandoned. The State, however, had established this important fact, "that the Michigan Canal is prac-

licable." From such facts as I have been able to obtain, by an examination of the reports of the United States Topographical Survey, and from information given me by Hon. Henry A. Shaw of Eaton, the gentleman who introduced the resolution, I can give, quite correctly I believe, the best general location of the line ; at least, the facts on which I base my opinion seem to warrant this conclusion, however much an actual and correct survey may vary it.

The greatest elevation in the Lower Peninsula is found in Hillsdale and the south part of Jackson Counties, which is 646 feet above Lake Erie. On this elevated plateau is located a cluster of over 100 lakelets, that give rise to the Huron, Raisin, St. Joseph, Kalamazoo, and Grand Rivers. The St. Joseph, Kalamazoo, and Grand head so nearly together, and so nearly on the same plane, that they could be easily united and the waters of either two caused to flow into the remaining one. The Grand runs north 25 miles to Jackson, where it is 325 feet above Lake Erie ; from Jackson it continues north to Eaton Rapids ; at this point it cannot be far from 250 feet above lake level, and this I believe to be the true summit level. Beginning, then, on Lake Michigan, at the mouth of the Kalamazoo, a harbor which the General Government has already found it necessary to improve, and located at the best point for the united commerce of Chicago, Racine, and Milwaukee, we find the river susceptible of slack-water improvement for a considerable distance, and at no great expense as far perhaps as Kalamazoo or Battle Creek. At Kalamazoo the elevation above lake level is 148 feet ; at Battle Creek, 200 feet. From this point the river has a more rapid ascent, it being 248 feet above lake level at Marshall and 345 feet at Albion. In order that the summit level may be kept as low as practical elongations will admit, it is deemed best to leave the valley of the Kalamazoo at Battle Creek City, and follow the Battle Creek branch of the Kalamazoo on a long radiant north around to near Eaton Rapids, which we will call the center of the arc. Then bending southerly to and crossing the Michigan Central Railroad at Dexter, on the Huron, which point is 232 feet above Lake Erie ; then following the valley of the Huron, striking

the Detroit River near Detroit, or near or below the mouth of the Huron, at pleasure.

As I have stated, the head waters of the St. Joseph can be turned into the Grand. This line would have, then, for water supply, the Kalamazoo ; Battle Creek, to which the Thornapple River may be added ; the Grand River for the summit level ; and the Huron, with a hundred interior lakes, as natural reservoirs for water storage.

I am unable to give the whole estimated cost of the Mount Clemens and Lake Michigan Canal ; but the cost of the Clinton and Kalamazoo Canal, length 216 miles, was \$2,250,000. The direct distance across the Peninsula from Lake Erie to Lake Michigan is 174 miles. I think a canal could be located on a line of 200 miles, and if the estimated cost of an ordinary canal for 216 miles was \$2,250,000, then a canal could be built with capacity for boats of 600 tons for three times the above estimate, \$6,750,000, or say \$7,000,000. Locks could be made cheaply of timber, and when these required restoring, the canal's own vessels could bring stone from our own quarries and deposit it whenever needed.

The only remaining question to consider is, "Will the Michigan Ship Canal pay ?"

COST OF TRANSPORTATION.

This subject was most thoroughly investigated by Mr. McAlpine, while State Engineer of New York, with the following results :

	Mills per ton per mile.
Ocean, long voyages,	1 ½
Ocean, short voyages,	2 to 6
Lakes, long voyages,	2
Lakes, short voyages,	3 to 4
Hudson River,	2 ½
Mississippi and St. Lawrence,	8
Erie Canal, enlarged,	4
Ordinary Canals,	5
Railroads, ordinary grades,	12 ½ to 13 ½

	Per cent greater cost.
By rail over ocean transportation,	733.3
By rail over Great Lakes,	525.0
By rail over Mississippi and St. Lawrence,	316.6
By rail over Hudson,	400.0
By rail over Illinois Improvement,	257.1
By rail over Erie Canal, enlarged,	215.0
By rail over ordinary canal,	150.0

"These are the elements, from which any one interested in this subject can compute the practical effects upon the productive industry of the country, and the enlarged area it will give to cultivation,—the result of increased avenues of communication between the Mississippi and the seaboard. The producer will have new motives to multiply his crops, while to the consumer will be held out the prospect of cheap bread."

The carrying trade between the Mississippi Valley and the seaboard, through and way, amounts to 25,000,000 tons annually. Before the Michigan Canal can be constructed, it will be increased to 30,000,000 tons. Assume that one-fourth of this amount would pass through this canal, it would then transport 7,500,000 tons. The distance in round numbers from Chicago to Buffalo is 1,000 miles. This, at 2 mills per ton per mile, equals \$2 per ton the whole distance. The canal will shorten the voyage about one-half; hence, saving one-half the cost of transportation, or \$1 per ton, equaling \$7,500,000 per annum,—a sum greater than the cost of the canal. One-fourth of this saving as toll gives canal receipts \$1,875,000, leaving a net saving to the producer of \$5,625,000. Charge \$700,000, 10 per cent as interest, on construction account, and \$300,000 to superintendent and repair account, against receipts from tolls, and it leaves \$875,000 annual net surplus.

Again, aside from distance, there is a further saving. The report of the Detroit Board of Trade, speaking of the more serious lake disasters for 1872, says "it has been estimated by competent authority that these reached about 750 in number, causing losses aggregating about \$3,000,000; those for November alone reaching fully \$1,000,000, and for September about \$800,000. Add the damage by minor disasters, such as loss of deck

loads, canvas, outfit, collision, etc., and the total amount will be swelled to nearly \$3,250,000."

Two million dollars of this loss can be properly charged to the waters lying above the line of the proposed canal,—Upper Lake Michigan, the Straits of Mackinaw, Lake Huron and St. Clair River, include the most dangerous portions of the lake voyage. Without referring to the item of extra insurance, this saving of lake wrecks alone would be sufficient, with the present amount of commerce, to support the canal. In five years, or, at farthest, ten years, this lake commerce will be doubled, and a corresponding loss would soon reach a sum greater than the cost of the canal. True, the canal will not save all the lake disasters; but vessels from any port, on either Lake Erie or Michigan, bound for the canal, could so time themselves as scarcely ever to be caught out in the severest storms; and I cannot doubt that, by the canal, enough vessels would be saved in five years to pay for its construction.

The cost of improving the line from the Hudson River to Chicago so as to admit of vessels of 600 tons, is as follows: Erie Canal, \$13,500,000; Niagara, \$3,610,000; Michigan, \$7,000,000; total, \$24,110,000: add Illinois Improvement, \$13,460,000; Wisconsin and Fox River, \$1,662,000; grand total, \$39,232,000. This would connect New York City and St. Louis and New Orleans by an inland route for commerce or war.

It is estimated that with these improvements, the saving to transportation, on the tonnage now passing over this general line would amount annually to over \$50,000,000, or twice the cost of the improvements from New York City to Chicago.

What, Mr. Chairman, will not these improvements accomplish for us?

The existing population of Europe is 270,000,000, of whom 150,000,000 are consumers of cereals to the amount of nearly 1,000,000,000 bushels. Their means for further production are limited. The dependence of Great Britain upon foreign supplies each year becomes more apparent. In 1855 it amounted to 59.02 per cent, and in 1860 it rose to 88 per cent. With enlarged channels we can compete with the world for this foreign demand.

At proper prices our surplus would be almost unlimited, and the means must be supplied to the Northwest to market her surplus. Then the highlands of the Hudson would become the gateways to such a commerce as neither Tyre, nor Venice, nor Antwerp ever dreamed. Look toward this gateway now, and you see a golden chain of cities interlinked with silver villages, uniting the Bay of New York with the interocean chain of lakes, whose crystal waters carved out the peninsulas of the north ; and these clustering cities and villages are to New York State but the ripening fruits of her canal system.

Build the Michigan Ship Canal, and from Detroit to Saugatuck will arise a continuous line of populous, commercial, and manufacturing towns. Over half of the canal line will lie above the Michigan coal beds. The enlarged canals will be navigated from the Hudson to the Mississippi by steamers. Michigan coal will not only be mined and placed upon the banks of the canal in quantities sufficient to supply the passing fleets of vessels for their voyages from Chicago to Buffalo, where they would re-coal for New York, and from Buffalo to Chicago, but also to supply the immense manufacturing interests that will spring up along its banks. Here, at the mouths of the coal-pits, will be reduced great quantities of the oars of the Upper Peninsula, and the iron puddled and rolled, or converted into steel and fabricated for man's thousand wants, ready to be shipped to the marts of the world. Then, every bushel of Michigan grain, every pound of wool, every foot of her lumber, would be consumed where produced, and Michigan, like New York, would grow rich from her products, her canals, her roads, and her carrying trade.

Motley speaks of Antwerp, the proud metropolis of the early Netherlands, grown from the commerce of her canals to be mistress of the seas,—where 500 vessels wet with the dews of every ocean, and from all their ports furled their weary sails each day, and 500 more spread their fresh canvas and turned their prows oceanward. One thousand ships a day, with yard and rigging from mizzen and main to foremast manned with hardy seamen, working in concert, keeping cadenced time with their rough but thrilling songs of the sea. These were the schools that gave Van Roosts and

